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EXAMINER

TRAN, DOUGLAS Q

ART UNIT

PAPER NUMBER

2624

DATE MAILED: 09/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/459,409

Applicant(s)

LAPSTUN ET AL.

Examiner

Douglas Q. Tran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 May 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 6 and 8-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 8-15 and 17 is/are allowed.
- 6) ☒ Claim(s) 1-3, 6 and 16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-2, 6, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Silverbrook (US Patent No. 5,784,077) and Sullivan et al. (US Patent No. 4,739,344).

As to claim 1, Silverbrook teaches a controller (i.e., a driver module 550 in fig. 7) for controlling printing on both surfaces of a sheet of print media (col. 33, lines 16-17: the simplified module 550 actually includes two of actual modules 550, each module 550 for each side of the sheet), the controller including:

a first print controller (i.e., a controller micro-computer 511, which is included in a first module 550 in fig. 8, would be representative of a first print controller "col. 33, lines 55-57") for controlling printing by a page width printhead of a first print engine (in fig. 8: this print head 50 of this first module 550 that is representative of a page width printhead of the print engine "col. 30, line 66");

a second print controller (the other module 550 in fig. 8 is described as the second module in the printer including a second controller micro-computer 511 which would be representative of a second print controller "col. 33, lines 55-57") for controlling printing by a

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page width printhead of a second print engine (50 in fig. 8: this print head of the second module that is representative of a page width printhead “col. 30, line 66”);

(It is noted that the printing module “574 in fig. 6”, which is representative of a printer, comprises the driver module “550 in fig. 7”. The driver module 550 of the printer, which is representative of a simplified controller, includes two of modules 550. Each module 550, which is representative of a print engine, has a print controller 511 for controlling the print head for printing each side of the sheet “col. 33, lines 16-17”. Thus, the function of the combination of two modules for performing the both sides of a sheet);

a second communications link (578 in fig. 6) interconnecting at least one of the print controllers (511 in fig. 8) with a host system (either one of workstation 576 or a raster image processor in fig. 6) for receipt from the host system of descriptions of pages (i.e., the page layout in the form of the page description language) to be printed on the surfaces of the sheet of print media by the print engines (the host computer “col. 31, lines 39-42” generates image data and laid-out pages “col. 31, lines 39-44” in form of a page description language “col. 31, lines 65-66” that is sent to a printer 574 “col. 32, lines 61-63”. The above information would include the information of pages to be printed on the sides of the sheet of the print media by the print engines because the printer has a function for printing both sides of the sheet “col. 31, lines 15-16 and col. 33, lines 16-17”);

However, Silverbrook does not teaches the first print controller for synchronizing with the second print controller through a first communication link in order for the printing of the printhead of the first module is controlled substantially simultaneously with the printing of the printhead of the second module.

Sullivan, in the same field of endeavor, teaches the first print controller (i.e., a master controller 16 in fig. 1) and the second print controller (i.e., a slave controller 18 in fig. 1) are synchronized (col. 7, lines 59-66) through a first communications link (please see two arrows with the information of "RCLK" and "SENSOR INFO." in figure 1 which would be considered as a communications link), so that the printhead (14 in fig. 2a) of the second print engine (fig. 2a) is controlled substantially simultaneously with the printing by the printhead (12 in fig. 2) of the first print engine (fig. 2) (col. 2, line 62 to col. 3, line 1).

(It is noted that Sullivan teaches a master controller "16 in fig. 1" for controlling printing by a printhead of a first print engine "12 in fig. 1"; col. 4, lines 61-62: the master controller for controlling the energization of the printhead "12 in fig. 1" in the first print engine "fig. 2"; the term of "the energization" would be considered as the printing operation. Col. 4, lines 63-64 describes that a slave controller "18 in fig. 1" for controlling the energization of the printhead "14 in fig. 1" in a second print engine "fig. 2a" substantially simultaneously with the printing by the printhead of the first print engine "col. 2, line 62 to col. 3, line 1" because the energization of the first print head is synchronized with the energization of the second print head "col. 3, lines 8-15")

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the first print controller (i.e., the first control Microcomputer 511 of the first module 550) in Silverbrook would be synchronized with the second print controller via the first communications link whereby the printing of the first printhead is simultaneously controlled with the second printhead as taught by Sullivan. The suggestion for modifying the print controllers of Silverbrook can be reasoned by one of ordinary skill in the art as set forth

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above by Sullivan because the modified printing system of Silverbrook would be desirable to provide an improvement of the first print controller that has increased functionalities for directly communicating and synchronizing with the second print controller through a communication link so that the printhead of the second print engine is controlled substantially simultaneously with the printing by the printhead of the first print engine (fig. 2; col. 2, line 62 to col. 3, line 1 as taught by Sullivan). Therefore, the performing of both of the printheads in the print engines is more efficiency and faster in parallel relation each other when they are directly controlled by one of the print-engine controller.

As to claim 2, Silverbrook and Sullivan disclose every feature discussed in claim 1, and Sullivan further teaches that the first print controller is a master print controller (16 in fig. 1) and the second print controller is a slave print controller (18 in fig. 1) operable under command of the master print controller on receipt of signals via the first communications link (col. 3, lines 8-15) (It is noted that, col. 6, lines 11-16, the clock generator 32 in the master controller 16 in figure 2 generates the RCLK signals to actuate the slave controller 18 for energizing the print head 14. The slave controller receives the above signals and sensor information signals from the master controller for controlling the second print head 14 "col. 7, lines 59-66).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the second controller of Silverbrook in order to be operable under command of the first controller via the communication link as taught by Sullivan. The suggestion for modifying the second controller of Silverbrook can be reasoned by one of ordinary skill in the art as set forth above by Sullivan because the modified printing system of Silverbrook would be desirable to provide an improvement of the second print controller that has increased

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functionalities for directly communicating and being synchronized by the first print controller through a communication link. Therefore, the printhead of the second print engine is controlled substantially simultaneously with the printing by the printhead of the first print engine (fig. 2; col. 2, line 62 to col. 3, line 1 as taught by Sullivan); and the performing of both of the printheads in the print engines is more efficiency and faster in parallel relation each other when the slave controller is directly controlled by the master controller.

As to claim 6, Silverbrook and Sullivan disclose every feature discussed in claims 1 and 2, and Sullivan further teaches that print synchronization is achieved by the master print controller controlling a printing operation of the slave print controller (col. 7, lines 59-66: the slave controller receives both RCLK signals and sensor signals from the master controller 16, and it is operative for controlling the slave strobe circuit to energize the second print head in response to the RCLK signals from the master controller so that the energization of the second print head is synchronized with the energization of the first print head).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the master print controller in Silverbrook and Sullivan for controlling the printing operation in synchronization with a printing operation of the slave print controller as taught by Sullivan. The suggestion for modifying the master print controller of Silverbrook and Sullivan can be reasoned by one of ordinary skill in the art as set forth above by Sullivan because the modified printing system of Silverbrook and Sullivan would be desirable to provide an improvement of the first print controller that has increased functionalities for directly controlling and synchronizing with the slave print controller so that the printhead of the second print engine is controlled substantially simultaneously with the printing by the printhead of the

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first print engine (fig. 2; col. 2, line 62 to col. 3, line 1 as taught by Sullivan). Therefore, the performing of both of the printheads in the print engines is more efficiency and faster in parallel relation each other when they are directly controlled by the master controller.

As to claim 16, due to the similarity of this claim to that of claim 1, this claim is rejected as the reason applied to claim 1.

3. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Silverbrook and Sullivan as applied to claim 2 above, and further in view of Ikenoue et al. (US Patent No. 5,251,295).

As to claim 3, Silverbrook and Sullivan disclose every feature discussed in claims 1 and 2. Sullivan further teaches the first communication link enabling the transmission of data (please see the signal "RCLK" is transmitted through a communication link) from the master print controller to the slave print controller (col. 7, lines 59-64).

However, Sullivan does not teach the communication link is a bi-directional link enabling the transmission of data from the slave print controller to the master print controller.

Ikenoue, in the same field of endeavor, teaches the communication link (a coupling means 104 in fig. 1B) is a bi-directional link (col. 9, lines 46-49) enabling the transmission of data from the slave controller (i.e., slave data processor 100 in fig. 1B) to the master controller (i.e., master data processor 102 in fig. 1B) (It is noted that the slave data processor 100 transfers the detailed information and the brief information through the bi-directional coupling means to the master data processor 102 "col. 9, lines 58-65")

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the communication link of the combination of Silverbrook and Sullivan to be a bi-directional communication link for enabling the transmission of data from the slave controller to the master controller as taught by Ikenoue. The suggestion for modifying the communication link of the combination of Silverbrook and Sullivan can be reasoned by one of ordinary skill in the art as set forth above by Ikenoue because the modified printing system of the Silverbrook and Sullivan would be desirable to provide the improvement of the communication link for exchanging data between the controllers in bi-directional communication. Therefore, the master controller would be able to keep track the status of the second print engine by providing from the slave controller and easily control the slave controller by transmitting the command data.

Allowable Subject Matter

4. Claims 8-15 and 17 are allowed.

Claims 8, 14, 15 and 17 are independent claims.

The following is an examiner's statement of reasons for allowance:

As to claim 8, the present invention comprising a method of controlling printing on both surfaces of a sheet of print media by the first and second print controllers. The closest prior art of Silverbrook (US Patent No. 5,784,077) discloses the simplified module includes two of actual modules, each module independently for printing each side of the sheet; and Sullivan et al. (US Patent No. 4,739,344) teaches two controllers, each for controlling each printhead in the synchronization. However, both of the closest prior art, including an electronic text search,

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would not teach steps of “receiving data relating to a first page to be printed in a first print controller of a first print engine; transmitting the data relating to the first page from the first print controller to a second print controller of a second print engine; receiving data relating to a second page to be printed in the first print controller; and controlling printing by the print engines under command of the first print controller to achieve synchronization of printing of the pages by the first print controller and the second print controller on rear and front surfaces of the print media, respectively”. These distinct features render independent claim allowable.

As to claim 14, the limitations of claim 14 written in independent form including all of the limitations of the based claim 1, the intervening claim 2 and the objected claim 4, the allowable claim includes the limitations “the master print controller of the first print engine to present a unified view to the host system to mask the presence of the slave print controller of the second print engine through the second communication link”.

As to claim 15, the limitations of claim 15 written in independent form including all of the limitations of the based claim 1, the intervening claim 2 and the objected claim 5, the allowable claim includes the limitations: “the master print controller prints describes pages on a rear surface of the print media with the slave print controller printing on a front surface of the print media so that the master print controller always has a page buffer available for a page description destined for the slave print controller.”.

As to claim 17, the limitations of claim 17 written in independent form including all of the limitations of the based claim 1, the intervening claim 2 and the objected claim 7, the allowable claim includes the limitations “both of the master print controllers of the first print engine and the slave print controller of the second print engine, operable under command of the

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master print controller on receipt of signals via the first communications link, have printhead interfaces which are synchronized to a synchronization signal through a shared line generated by one of the print controller.

Examiner's Remark

Since the independent claims are added, the Applicant is requested for paying the additional independent claims.

Response to Arguments and Amendment

Applicant's arguments filed have been fully considered but they are not persuasive. Applicant asserted in page 8 "However, Sullivan is concerned with a pair of printheads that are mounted end to end to form a double width printhead, which is an entirely different situation to duplex printing with a pair of pagewidth printheads". In reply, Silverbrook does not teaches the first print controller for synchronizing with the second print controller through a first communication link in order for the printing of the printhead of the first module is controlled substantially simultaneously with the printing of the printhead of the second module. While Sullivan teaches the first print controller (i.e., a master controller 16 in fig. 1) and the second print controller (i.e., a slave controller 18 in fig. 1) are synchronized (col. 7, lines 59-66) through a first communications link (please see two arrows with the information of "RCLK" and "SENSOR INFO." in figure 1 which would be considered as a communications link), so that the printhead (14 in fig. 2a) of the second print engine (fig. 2a) is controlled substantially simultaneously with the printing by the printhead (12 in fig. 2) of the first print engine (fig. 2)

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(col. 2, line 62 to col. 3, line 1). Therefore, the teaching of the connection between the controllers in Sullivan which submits the deficiencies of the controllers in Silverbrook.

Applicant asserted in page 9 “ However, Ikenoue is concerned with an image processing system in which master and slave processors communicate with each other to process image data” and “the modules disclosed in Ikenoue are not print controllers, nor is there even any mention of print controllers in Ikenoue” . In reply, the test for obviousness is not whether the features of one reference may be bodily incorporated into the other reference to produce the claimed subject matter, but what the references would have suggested to one of ordinary skill in the art. See In re Beckum 169 USPQ 47 (CCPA 1971); In re Sneed, 218 USPQ 385 In re Keller, 208 USPQ 871 (CCPA 1981).

For the above reasons, it is believed that the cited prior art fully discloses the claimed invention and the rejection stand.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

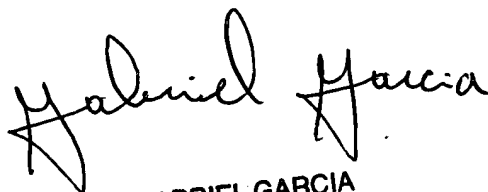
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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas Q. Tran whose telephone number is (703) 305-4857 or E-mail address is Douglas.tran@uspto.gov.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 305-4700.

Douglas Q. Tran
Sep. 19, 2003


GABRIEL GARCIA
PRIMARY EXAMINER